

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-6. (Canceled).

7. (Currently Amended) ~~An optical signal transmission device as claimed in claim 3,~~ An optical signal transmission device for transmitting phase information of optical signals comprising:

a multiplexing formatted optical signal generator arranged to generate multiplexing formatted optical signals; and

an optical phase generator arranged to receive the multiplexing formatted optical signals,

wherein the multiplexing formatted optical signal generator comprises an optical time division multiplexing (OTDM) carrier suppressed - return to zero (CS-RZ) signal generator arranged to generate OTDM-CS-RZ signals comprising signal light, and

wherein the optical phase generator comprises an optical phase conjugator arranged to receive the OTDM-CS-RZ signals from the OTDM CS-RZ signal generator,

wherein said optical phase conjugator comprises:

a continuous wave (CW) pump light source that emits pump light;

a pump light amplifier arranged to amplify the pump light emitted by the CW pump light source;

a first phase conjugator arranged to arrange the phase of the signal light;

a signal light amplifier arranged to amplify the signal light;

a second phase conjugator arranged to arrange the phase of the signal light;

an optical coupler arranged to couple the signal light and the pump light from the first phase conjugator and the second phase conjugator and emit the coupled light;

a first and a second semiconductor amplifier (SOA) arranged to amplify the coupled light and provide phase conjugated light; and

a light filter arranged to filter the phase conjugated light from the second SOA.

8. (Currently Amended) ~~An optical signal transmission device as claimed in claim 1,~~ An optical signal transmission device for transmitting phase information of optical signals comprising:

a multiplexing formatted optical signal generator arranged to generate multiplexing formatted optical signals; and

an optical phase generator arranged to receive the multiplexing formatted optical signals,

wherein said multiplexing formatted optical signal generator comprises:

a first optical coupler arranged to divide a received signal evenly at a rate of 1:1 into a first portion and a second portion;

a first phase shifter arranged to receive the first portion and to arrange the phase of the first portion;

a second phase shifter arranged to receive the second portion and to arrange the phase of the second portion;

a second optical coupler arranged to couple the light emitted by the first phase shifter with the light emitted by the second phase shifter and emit a first coupled signal;

a third optical coupler arranged to divide the first coupled signal evenly at a rate of 1:1 into a third portion and a fourth portion;

a third phase shifter arranged to receive the third portion and to arrange the phase of the third portion;

a fourth phase shifter arranged to receive the fourth portion and to arrange the phase of the fourth portion; and

a fourth optical coupler arranged to couple the light emitted by the third phase shifter with the light emitted by the fourth phase shifter and emit a second coupled signal.

9. (Original) An optical signal transmission device as claimed in claim 8, further comprising:

a fifth optical coupler arranged to divide the second coupled signal evenly at a rate of 1:1 into a fifth portion and a sixth portion;

a fifth phase shifter arranged to receive the fifth portion and to arrange the phase of the fifth portion;

a sixth phase shifter arranged to receive the sixth portion and to arrange the phase of the sixth portion; and

a sixth optical coupler arranged to couple the light emitted by the fifth phase shifter with the light emitted by the sixth phase shifter and emit a third coupled signal.

10 -18. (Canceled).

19. (Currently Amended) ~~An optical information transmission method as claimed in claim 18;~~ An optical information transmission method for transmitting optical signal information including phase information comprising:

receiving multiplexing formatted optical signals generated by a multiplexing formatted optical signal generator at an optical phase generator;

phase conjugating the multiplexing formatted optical signals by means of four wave mixing (FWM); and

generating the multiplexing formatted optical signals using the multiplexing formatted optical signal generator.

wherein the generating the multiplexing formatted optical signals comprises:

dividing a received signal evenly at a rate of 1:1 into a first portion and a second portion;

arranging the phase of the first portion;

arranging the phase of the second portion;

coupling the first portion having a conjugated phase and the second portion having a conjugated phase to provide a first coupled signal;

dividing the first coupled signal evenly at a rate of 1:1 into a third portion and a fourth portion;

arranging the phase of the third portion;

arranging the phase of the fourth portion; and

coupling the third portion having a conjugated phase and the fourth portion having a conjugated phase to provide a second coupled signal.

20. (Original) An optical information transmission method in claim 19, wherein the generating the multiplexing formatted optical signals further comprises:

dividing the second coupled signal evenly at a rate of 1:1 into a fifth portion and a sixth portion;
arranging the phase of the fifth portion;
arranging the phase of the sixth portion; and
coupling the fifth portion having an arranged phase and the sixth portion having an arranged phase to provide a third coupled signal.

21. (Canceled).